

Criteria for Setting Meaningful Regional Population Objectives

An Overview of Current Thinking

Randy Dettmers
Division of Migratory Birds – Northeast Region
U.S. Fish and Wildlife Service
Hadley, MA





Setting Population Objectives – Context for the Process

- A Challenging Process
 - Many potential outcomes, not one “right” answer
 - Dependent on opinions of people involved
 - Dependent on technical capacity

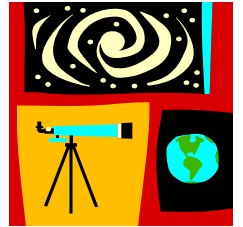
- Population Objective, Population Estimate, Habitat Objective
 - Will we get confused??.... Yes, but it's OK!



Setting Population Objectives – Context for the Process



- Forces compromises between “objective” science and “subjective” values
- Science: necessary for showing consequences of alternatives and for quantifying “viability” & “capacity”
- Ultimately it is human values set against the realities of current ecological, economic, and sociopolitical factors





Population-based Approaches to Setting Conservation Targets

(from Sanderson 2006)

- Evolutionary potential (maintain genetic diversity)
- Demographic sustainability (self-sustaining MVP)
- Ecological Function (density, social relationships)
- Status quo (maintain present state)
- Historic baselines (restore historic conditions)
- Projected Future Condition (what can future habitat capacity & other conditions support)
- Maximum (as many as we can get)



Functions of Population Objectives



- Communication and Marketing Device
 - demonstrating need; catalyzing action
- Foundation for Strategic Conservation
 - Adaptive Management
 - Conservation Design
- Define Performance Metrics
 - Accessing Accomplishments
 - Evaluating Assumptions



Commonly Recognized Characteristics of Useful Population Objectives

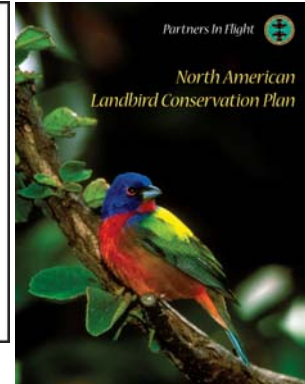
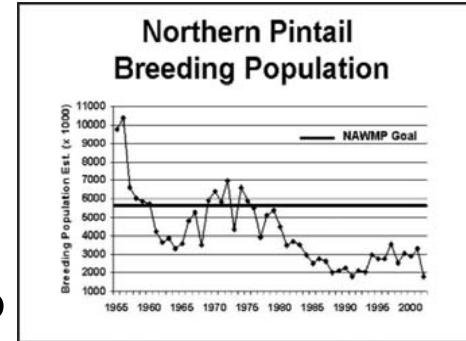
- Achievable (realistic, not totally idealistic)
- Easy to communicate & understand
- Consistent with other conservation plans
- Quantitative
- Appropriate as a performance measure at the scale of interest
- Easy to measure with current methods
- Easy to link across spatial and temporal scales
- Robust to uncontrolled environmental variation

Types of Quantitative Population Objectives

1. Abundance-based Objectives

Examples:

1.3 million breeding birds
Increase population by 50%



2. Performance-based Objectives (Vital Rates)

Examples:

0.6 recruitment rate
90% female survival during breeding
15% increase in lipid reserves
of migrants



An ideal regional population objective has both abundance-based and performance-based components



Abundance-based Objectives

Arbitrary – A value-based statement, but most effective when grounded in reality through science

A tool for fostering consensus & action among partners

There need to be mechanisms to account for “unmanaged” factors, such as environmental variation, in order to compare monitoring results to objectives

Low potential to assess management performance locally

Continental

Regional

Local

Value of Abundance-based Objectives as Performance Indicators

Higher

Low



Performance-based Objectives

Suitable performance metrics at more local scales

Facilitates identification of limiting factors

Typically match the temporal scale of management decisions but more intensive to monitor

Good potential to assess management performance locally

Continental

Regional

Local



Value of Performance-based Objectives as Performance Indicators

Low

High





Additional Criteria For Regional Population Objectives

The Null Hypotheses



1. Based on Methods that Account for Detectability
 - a. Allows easy comparison and rolling-up
2. State Acceptable Level of Precision
 - a. Methods must provide precision estimates
3. Based on clearly stated and testable assumptions
 - a. Ecologically-based models that allow assessment of current and future "capacity"



Additional Criteria For Regional Population Objectives

The Null Hypotheses

4. Quantitative

- a. Breeding season = population size
 - i. Complimented with vital rate objectives for assessing management, understanding limiting factors, and linking with abundance
- b. Non-breeding season = vital rate reflecting a limiting factor
 - i. Are vital rates most appropriate? How can non-breeding objectives be rolled up to larger scales? Population size during non-breeding?



Summary



- Population Objectives = balance between science and human values
- Need to be understandable, achievable, measurable, scale-appropriate
- Hypothesis: based on methods that allow for detectability, precision estimates, testable assumptions
- Hypothesis: breeding = population size + complimentary vital rate(s); non-breeding = vital rate linked to limiting factors